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09/545,872	04/06/2000	Walter G.A. Muller	2380-166	1788

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EXAMINER

D AGOSTA, STEPHEN M

ART UNIT

PAPER NUMBER

2684

DATE MAILED: 08/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PRG

Office Action Summary

Application No.

09/545,872

Applicant(s)

MULLER, WALTER G.A.

Examiner

Stephen M. D'Agosta

Art Unit

2684

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13-17, 20-23, 26-29, 32-45, 48-52, 55 and 56 is/are rejected.
- 7) ☒ Claim(s) 11, 12, 18, 19, 24, 25, 30, 31, 46, 47, 53, 54 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1-5. 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

Claims 18, 24, 30 and 53 objected to because of the following informalities: *The actual equation should be included/written in the claim.* Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 13-17, 20, 22, 23, 26, 28, 29, 32, 34-45, 48-52 and 55 rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver Jr. et al. U.S. Patent 5,848,063 and further in view of Kumar et al. U.S. Patent 6,097,954 (hereafter referred to as Weaver and Kumar).

As per **claims 1, 22 and 36**, Weaver teaches a telecommunications network wherein a user equipment unit (UE), using one of a cell or a current active set of base stations on a first frequency (eg. Active Set, C13, L46-50), maintains a virtual active set of base stations on a second frequency (eg. Neighbor and Candidate Sets, C13, L50-55), and makes frequency measurements made at the user equipment unit (UE) so warrant (C13, L56-67 – remote unit stores Active/Neighbor/Candidate lists and makes measurements),

(claim 22 only) and wherein the virtual active set of base stations on the second frequency is maintained by a second operator which differs from a first operator which maintains the current active set of base stations on the first frequency. [C7, L61-66].

But is silent on:

(claim 20/22) whereby the user equipment unit (UE) can switch to the virtual active set of base stations.

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The examiner notes that while Weaver devotes considerable teachings regarding handoffs within one system, his invention further allows the ability to handoff a user from one cell system to a second, different cell system. Hence, much of his teachings focus on pilot signal measurements and not voice channel SNR/RSSI measurements. This is because one skilled in the art knows that a cellular system can handover a call if the voice channel SNR/RSSI falls below a certain level (not due to the user roaming near a cell boundary) but for other reasons (ie. going into a building, moving behind a building, moving near a source of RF interference, etc.). Measurements taken regarding these situations would also warrant a handoff as well [C1, L53-67].

Since Weaver also teaches the ability to handoff between both intra-network and inter-network, the mobile unit will have to keep track of the different sets of frequencies available for each possible handoff scenario (C20, L34-45, C9, L7-9 and C24, L44-53).

Kumar teaches the mobile unit being able to receive a message from the candidate Base Station (abstract) – candidate being part of the Candidate Set.

-- Note that figure 8, step #720 states that the call processor sends copies of a HD message to the active set base stations and the candidate base station which proves that the candidate is not contained in the active base stations set.

Kumar also teaches a soft handoff process whereby a connection is made to the candidate base station (C5, L38-41), which parallels a virtual active set since it is not part of the active set. This teaching can be modified to also include multiple candidate base stations (eg. encompass the entire Neighbor or Candidate list of base stations).

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the user equipment unit (UE) can switch to the virtual active set of base stations, to provide a means for the mobile unit to connect to a second group/set of base stations within the local area.

As per **claims 2 and 37**, Weaver teaches the network of claim 1 and 36, wherein the frequency measurements made at the user equipment unit (UE) are triggered periodically or immediately and/or in response to a predetermined event (ie. measure pilot and voice channel RF links for SNR/RSSI periodically as the user roams and a change is triggered immediately based on the event that the measurements fall below a predefined threshold – C13, L58-60).

As per **claims 3 and 38**, Weaver teaches the network of claim 1 and 36, wherein in response to a measurement trigger criteria, the user equipment unit (UE) performs and reports inter-frequency measurements for the second frequency (C14, L12-23).

As per **claims 4 and 39**, Weaver teaches the network of claim 3 and 38, the measurement trigger criteria which causes the user equipment unit (UE) to perform and report inter-frequency measurements for the second frequency is the same criteria which is employed to cause the user equipment unit (UE) to perform and report intra-frequency measurements for the first frequency (C14, L12-23 teaches same measuring process for Active, Neighbor and Candidate base stations).

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As per **claims 5 and 40**, Weaver teaches the network of claim 3 and 38, wherein the measurement trigger criteria is one of being periodically, immediate, or in response to a predetermined event (ie. measure pilot and voice channel RF links for SNR/RSSI periodically as the user roams and a change is triggered immediately based on the event that the measurements fall below a predefined threshold – C13, L58-60).

As per **claims 6 and 41**, Weaver teaches the network of claim 1 and 36, wherein when the frequency measurements made at the user equipment unit (UE) so warrant, the network issues an inter-frequency handover command to the user equipment unit (UE) that the user equipment unit (UE) switches to the virtual active set of base stations (C20, L34-45 shows intersystem CDMA-to-different frequency CDMA handoff which requires an inter-frequency handover command to the user terminal).

As per **claims 7 and 42**, Weaver teaches the network of claim 1 and 36, **but is silent on** wherein the network provides information regarding the virtual active set of base stations on the second frequency in a measurement control message.

Weaver does allude to the fact that a hard handoff between two different systems will require the mobile unit to change frequency (C9, L7-9). One skilled in the art would understand that the mobile unit must be able to operate within both systems' frequency ranges and receive control information on differing frequencies (eg. handoff/pilot measurement system data from the AMPS network and similar data on a different frequency from the CDMA network).

Kumar teaches the mobile unit being able to receive a message from the candidate Base Station (abstract) – which one skilled in the art would interpret as being on a second frequency that is different from the frequency connecting the unit to the primary base station.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the network provides information regarding the virtual active set of base stations on the second frequency in a measurement control message, to provide an alternate communications channel/frequency upon which to communicate handover information on.

As per **claims 8 and 43**, Weaver teaches the network of claim 7 and 42, **but is silent on** wherein the measurement control message is included in a DCCH control channel.

One skilled in the art realizes that the DCCH is used to send control data to/from the mobile unit and would be among the choices of ways in which to communicate data between the mobile unit and the cellular network.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, wherein the measurement control message is included in a DCCH control channel, to take advantage of the DCCH communications channel for information conveyance and not require a separate communications means.

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As per **claims 9 and 44**, Weaver teaches the network of claim 7 and 42, wherein the measurement control message further includes one of a measurement parameter to be measured (eg. measurement of the pilot, C13, L56-60) and a predetermined measurement event which triggers a measurement (C13, L60-67).

As per **claims 10 and 45**, Weaver teaches the network of claim 1 and 36, wherein the network provides at least one member of the virtual active set of base stations on the second frequency in a virtual active set update procedure (C14, L4-7).

As per **claims 13 and 48**, Weaver teaches the network of claim 1 and 36, wherein the virtual active set of base stations on the second frequency is maintained by a second operator (eg. 2nd cellular system) which differs from a first operator which maintains the current active set of base stations on the first frequency (eg. 1st cellular system) [C7, L61-66].

As per **claims 14 and 49**, Weaver teaches the network of claim 1 and 36, wherein the virtual active set of base stations on the second frequency comprises a second network system which differs from a first network system provided on the first frequency [C7, L61-66 and C20, L39-40 teaches CDMA-to-AMPS handoff which differ in frequencies used].

As per **claims 15 and 51**, Weaver teaches the network of claim 14 and 49, **but is silent on** wherein the second network system is universal mobile telecommunications (UMTS) and the first network system is a Global System for Mobile (GSM) system (**AND OR VICE VERSA**).

Weaver teaches his invention applying to multiple cellular system, including CDMA, AMPS (both at C20, L38-45, PCS (C9, L9), TDMA and FDMA (C5, L35-40). Weaver states that the principles he teaches are not meant to be limited to the embodiments taught in the invention (C33, L46-53) and generic principles may be applied to other embodiments/systems. Hence, UMTS and GSM would be candidate systems.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the second network system is universal mobile telecommunications (UMTS) and the first network system is a Global System for Mobile (GSM) system, to provide a means for handing off between various communications systems.

As per **claims 16 and 50**, Weaver teaches the network of claim 14 and 49, wherein the second network system is a system having soft intra-frequency handover (C7, L43-45 and C20, L44-45) **but is silent on** and the first network system is universal mobile telecommunications (UMTS).

Weaver teaches his invention applying to multiple cellular system, including CDMA, AMPS (both at C20, L38-45, PCS (C9, L9), TDMA and FDMA (C5, L35-40).

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Weaver states that the principles he teaches are not meant to be limited to the embodiments taught in the invention (C33, L46-53) and generic principles may be applied to other embodiments/systems. Hence, UMTS would be a candidate system.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one of the network systems is UMTS, to provide a means for handing off to several different communications networks.

As per **claims 17 and 52**, Weaver teaches the network of claim 1 and 36, wherein the network utilizes a frequency quality estimate (eg. measurement of base station pilot signals, C13, L58-67) to determine when frequency measurements made at the user equipment unit (UE) warrant the switch to the virtual active set of base stations.

Note that the voice channel SNR/RSSI is also monitored, although Weaver does not focus on this facet, and a handoff will occur if a threshold is exceeded.

As per **claims 20 and 55**, Weaver teaches the network of claim 17 and 52, wherein the network compares the frequency quality estimate to at least one threshold to determine when frequency measurements made at the user equipment unit (UE) warrant the switch to the virtual active set of base stations (C13, L60-62).

As per **claim 23**, Weaver teaches the network of claim 22, wherein the network utilizes a frequency quality estimate (eg. measurement of base station pilot signals, C13, L58-67) to determine when frequency measurements made at the user equipment unit (UE) warrant the switch to the virtual active set of base stations.

Note that the voice channel SNR/RSSI is also monitored, although Weaver does not focus on this facet, and a handoff will occur if a threshold is exceeded.

As per **claim 26**, Weaver teaches the network of claim 23, wherein the network compares the frequency quality estimate to at least one threshold to determine when frequency measurements made at the user equipment unit (UE) warrant the switch to the virtual active set of base stations.

As per **claim 28**, Weaver teaches a telecommunications network wherein a user equipment unit (UE), using one of a cell or a current active set of base stations on a first frequency (eg. Active Set, C13, L46-50), maintains a virtual active set of base stations on a second frequency (eg. Neighbor and Candidate Sets, C13, L50-55), and wherein the virtual active set of base stations on the second frequency comprises a second network system which differs from a first network system provided on the first frequency [C7, L61-66 and C20, L39-40 teaches CDMA-to-AMPS handoff which differ in frequencies used].

But is silent on:

whereby the user equipment unit (UE) can switch to the virtual active set of base stations.

The examiner notes that while Weaver devotes considerable teachings regarding handoffs within one system, his invention further allows the ability to handoff a

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user from one cell system to a second, different cell system. Hence, much of his teachings focus on pilot signal measurements and not voice channel SNR/RSSI measurements. This is because one skilled in the art knows that a cellular system can handover a call if the voice channel SNR/RSSI falls below a certain level (not due to the user roaming near a cell boundary) but for other reasons (ie. going into a building, moving behind a building, moving near a source of RF interference, etc.). Measurements taken regarding these situations would also warrant a handoff as well [C1, L53-67].

Since Weaver also teaches the ability to handoff between both intra-network and inter-network, the mobile unit will have to keep track of the different sets of frequencies available for each possible handoff scenario (C20, L34-45 and C9, L7-9 and C24, L44-53).

Kumar teaches the mobile unit being able to receive a message from the candidate Base Station (abstract) – candidate being part of the Candidate Set.

-- Note that figure 8, step #720 states that the call processor sends copies of a HD message to the active set base stations and the candidate base station which shows that the candidate is not contained in the set of active base stations.

Kumar also teaches a soft handoff process whereby a connection is made to the candidate base station (C5, L38-41), which parallels a virtual active set since it is not part of the active set. This teaching can be modified to also include multiple candidate base stations (eg. encompass the entire Neighbor or Candidate list of base stations).

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that the user equipment unit (UE) can switch to the virtual active set of base stations, to provide a means for the mobile unit to connect to a second group/set of base stations within the local area.

As per **claim 29**, Weaver teaches the network of claim 28, wherein the network utilizes a frequency quality estimate (eg. measurement of base station pilot signals, C13, L58-67) to determine when frequency, measurements made at the user equipment unit (UE) warrant the switch to the virtual active set of base stations.

Note that the voice channel SNR/RSSI is also monitored, although Weaver does not focus on this facet, and a handoff will occur if a threshold is exceeded.

As per **claim 32**, Weaver teaches the network of claim 29, wherein the network compares the frequency quality estimate to at least one threshold to determine when frequency measurements made at the user equipment unit (UE) warrant the switch to the virtual active set of base stations (C13, L60-62).

As per **claim 34**, Weaver teaches the network of claim 28, **but is silent on** wherein the second network system is universal mobile telecommunications (UMTS) and the first network system is a Global System for Mobile (GSM) system.

Weaver teaches his invention applying to multiple cellular system, including CDMA, AMPS (both at C20, L38-45, PCS (C9, L9), TDMA and FDMA (C5, L35-40).

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Weaver states that the principles he teaches are not meant to be limited to the embodiments taught in the invention (C33, L46-53) and generic principles may be applied to other embodiments/systems. Hence, UMTS and GSM would be candidate systems.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one network system is universal mobile telecommunications (UMTS) and the other network system is a Global System for Mobile (GSM) system, to provide a means for handing off between various communications systems.

As per **claim 35**, Weaver teaches the network of claim 28, wherein the second network system is a system having soft intra-frequency handover (C7, L43-45 and C20, L44-45) **but is silent on** and the first network system is universal mobile telecommunications (UMTS).

Weaver teaches his invention applying to multiple cellular system, including CDMA, AMPS (both at C20, L38-45, PCS (C9, L9), TDMA and FDMA (C5, L35-40). Weaver states that the principles he teaches are not meant to be limited to the embodiments taught in the invention (C33, L46-53) and generic principles may be applied to other embodiments/systems. Hence, UMTS would be a candidate system.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one of the network systems is UMTS, to provide a means for handing off to several different communications networks.

Claims 21, 27, 33 and 56 rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver and Kumar and further in view of Bringby et al. U.S. Patent 6,285,883 (hereafter referred to as Bringby).

As per **claims 21 and 56**, Weaver teaches the network of claim 20 and 21, **but is silent on** wherein the at least one threshold is chosen to provide hysteresis protection.

Bringby teaches the concept of adaptive handoff hysteresis in a wireless network (title) in order to reduce (eg. protect against) the rate of oscillating handoffs from a routine mobile handoff during roaming (abstract). Received signal strength measurements are made in the originating cell and in at least one neighboring cell (abstract). This concept parallels the applicant's use of hysteresis.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one threshold is chosen to provide hysteresis protection, to stop/protect an oscillating back and forth between communications systems as user moves/roams.

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As per **claim 27**, Weaver teaches the network of claim 26, **but is silent on** wherein the at least one threshold is chosen to provide hysteresis protection.

Bringby teaches the concept of adaptive handoff hysteresis in a wireless network (title) in order to reduce (eg. protect against) the rate of oscillating handoffs from a routine mobile handoff during roaming (abstract). Received signal strength measurements are made in the originating cell and in at least one neighboring cell (abstract). This concept parallels the applicant's use of hysteresis.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one threshold is chosen to provide hysteresis protection, to stop/protect an oscillating back and forth between communications systems as user moves/roams.

As per **claim 33**, Weaver teaches the network of claim 32, **but is silent on** wherein the at least one threshold is chosen to provide hysteresis protection.

Bringby teaches the concept of adaptive handoff hysteresis in a wireless network (title) in order to reduce (eg. protect against) the rate of oscillating handoffs from a routine mobile handoff during roaming (abstract). Received signal strength measurements are made in the originating cell and in at least one neighboring cell (abstract). This concept parallels the applicant's use of hysteresis.

It would have been obvious to one skilled in the art at the time of the invention to modify Weaver, such that one threshold is chosen to provide hysteresis protection, to stop/protect an oscillating back and forth between communications systems as user moves/roams.

Allowable Subject Matter

Claims 11, 12, 18, 19, 24, 25, 30, 31, 46, 47, 53 and 54 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 11 and 46: Weaver teaches a network wherein the network sends the user equipment unit (UE) an authorization message that allows the user equipment unit (UE) to autonomously update the virtual active set of base stations when the frequency measurements made at the user equipment unit (UE) so warrant. ***Weaver does not teach an authorization or autonomous update.***

Claims 12 and 47: The network of claim 11, wherein the authorization message specifies one of an event or a parameter that can trigger the update of the virtual active set of base stations without the user equipment unit (UE) first having to send a measurement report to the network. ***Depend upon claims 11 and 46***

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Claims 18, 24, 30 and 53: The network wherein the frequency quality estimate is provided by Equation 1. ***Weaver does not teach an equation such as that provided by the applicant in the specification***

Claims 19, 25, 31 and 54: The network wherein the frequency quality estimate is based on two factors: (1) a carrier Radio Signal Strength Indication (RSSI); and (2) whether the Base Transceiver Station Identity Code/Base Station Identifier Code (BSIC) has been confirmed or not. ***Weaver does not teach a quality estimate being based on RSSI and BSIC confirmation***

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


1. Wallstedt et al. U.S. Patent 6,301,478 teaches intra-cell handover.
2. Kuo et al. U.S. Patent 6,181,943 teaches inter-frequency hand-off.
3. Wijk et al. U.S. Patent 5,995,836 teaches variable hand-off hysteresis.
4. Dupuy et al. U.S. Patent 5,613,203 teaches handover method.
5. Malkamaki et al. U.S. Patent 5,483,668 teaches handoff in mobile system.
6. Bruckert et al. U.S. Patent 5,920,549 teaches handing off wireless device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Hunter can be reached on 703-308-6732. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

SMD
July 30, 2002


THANH CONG LE
PRIMARY EXAMINER
